National Institute of Environmental Health Sciences

The urban heat island and its impact on heat waves and human health in Shanghai

Author(s): Tan J, Zheng Y, Tang X, Guo C, Li L, Song G, Zhen X, Yuan D, Kalkstein AJ, Li F

Year: 2010

Journal: International Journal of Biometeorology. 54 (1): 75-84

Abstract:

With global warming forecast to continue into the foreseeable future, heat waves are very likely to increase in both frequency and intensity. In urban regions, these future heat waves will be exacerbated by the urban heat island effect, and will have the potential to negatively influence the health and welfare of urban residents. In order to investigate the health effects of the urban heat island (UHI) in Shanghai, China, 30 years of meteorological records (1975-2004) were examined for 11 first- and second-order weather stations in and around Shanghai. Additionally, automatic weather observation data recorded in recent years as well as daily all-cause summer mortality counts in 11 urban, suburban, and exurban regions (1998-2004) in Shanghai have been used. The results show that different sites (city center or surroundings) have experienced different degrees of warming as a result of increasing urbanization. In turn, this has resulted in a more extensive urban heat island effect, causing additional hot days and heat waves in urban regions compared to rural locales. An examination of summer mortality rates in and around Shanghai yields heightened heat-related mortality in urban regions, and we conclude that the UHI is directly responsible, acting to worsen the adverse health effects from exposure to extreme thermal conditions.

Source: http://dx.doi.org/10.1007/s00484-009-0256-x

Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Temperature

Temperature: Extreme Heat

Geographic Feature:

resource focuses on specific type of geography

Urban

Geographic Location:

resource focuses on specific location

Non-United States

Non-United States: Asia

Asian Region/Country: China

Health Impact: ☒

specification of health effect or disease related to climate change exposure

Injury, Other Health Impact

Other Health Impact: heat related mortality

Resource Type: ☒

format or standard characteristic of resource

Research Article

Timescale: ☒

time period studied

Time Scale Unspecified